

Amendment and Response

Applicant: David E. Francischelli et al.

Serial No.: 10/752,135

Filed: January 6, 2004

Docket No.: M190.257.101/P8922.06

Title: SYSTEM FOR ASSESSING TRANSMURALITY OF ABLATION LESIONS

IN THE CLAIMS

Please amend claims 1, 13-15, 20 and 21 as follows:

1. (Currently Amended) A system for assessing transmurality of an ablation in a tissue comprising:

an ablation apparatus operatively adapted to deliver ablation energy to a first side of the tissue;

a temperature-sensing pad operatively adapted to sense temperature along a second side of the tissue opposite the first side in response to ablation energy delivered to the first side, the temperature-sensing pad comprising an array of temperature elements in close proximity to each other to effectively detect continuous temperature along the second side of the tissue, and at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the temperature-sensing pad to the tissue;

a suction source in communication with the suction opening, the suction source operatively adapted to provide suction to the suction opening; and

an output device in communication with the pad, the output device operatively adapted to indicate continuous transmurality of the ablated tissue based on the sensed temperature.

2. (Original) The system of claim 1 wherein the pad comprises temperature-sensing elements incorporated therein.

3. (Previously Presented) The system of claim 1 wherein the transmurality of the ablated tissue indicated by the output device is a function of the temperature sensed along the second side of the tissue.

4. (Original) The system of claim 2 wherein the temperature-sensing elements are arranged in a grid pattern.

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5. (Previously Presented) The system of claim 4 wherein the output device displays a representation of the grid pattern to indicate where the ablation is both transmural and continuous.
6. (Original) The system of claim 1 wherein the output device includes a processor for processing a signal received from the temperature-sensing pad.
7. (Original) The system of claim 1 wherein the output device includes an amplifier for amplifying a signal received from the temperature-sensing pad.
8. (Original) The system of claim 2 wherein the temperature-sensing elements are thermocouples.
9. (Original) The system of claim 2 wherein the temperature-sensing elements are thermistors.
10. (Original) The system of claim 2 wherein the temperature-sensing elements are temperature-sensing liquid crystals.
11. (Original) The system of claim 2 wherein the temperature-sensing elements are temperature-sensing chemicals.
12. (Original) The system of claim 2 wherein the temperature-sensing elements are operatively adapted to be located within the tissue.
13. (Currently Amended) The ~~A~~ system of claim 1 for assessing transmurality of an ablation in a tissue comprising:
an ablation apparatus operatively adapted to deliver ablation energy to a first side of the tissue;

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a temperature-sensing pad operatively adapted to sense temperature along a second side of the tissue opposite the first side in response to ablation energy delivered to the first side, wherein the pad is mounted on a glove, the temperature-sensing pad comprising at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the temperature-sensing pad to the tissue;

a suction source in communication with the suction opening, the suction source operatively adapted to provide suction to the suction opening; and
an output device in communication with the pad, the output device operatively adapted to indicate continuous transmuralty of the ablated tissue.

14. (Currently Amended) The A system of claim 1 for assessing transmuralty of an ablation in a tissue comprising:

an ablation apparatus operatively adapted to deliver ablation energy to a first side of the tissue;

a temperature-sensing pad operatively adapted to sense temperature along a second side of the tissue opposite the first side in response to ablation energy delivered to the first side, wherein the pad is formed as a portion of a glove, the temperature-sensing pad comprising at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the temperature-sensing pad to the tissue;

a suction source in communication with the suction opening, the suction source operatively adapted to provide suction to the suction opening; and
an output device in communication with the pad, the output device operatively adapted to indicate continuous transmuralty of the ablated tissue.

15. (Currently Amended) The A system of claim 1 for assessing transmuralty of an ablation in a tissue comprising:

an ablation apparatus operatively adapted to deliver ablation energy to a first side of the tissue;

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a temperature-sensing pad operatively adapted to sense temperature along a second side of the tissue opposite the first side in response to ablation energy delivered to the first side, wherein the pad is operatively adapted to be fitted over a finger-, the temperature-sensing pad comprising at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the temperature-sensing pad to the tissue;

a suction source in communication with the suction opening, the suction source operatively adapted to provide suction to the suction opening; and
an output device in communication with the pad, the output device operatively adapted to indicate continuous transmuralty of the ablated tissue.

16. (Original) The system of claim 1 wherein the pad further comprises a conductive element incorporated therein.

17. (Original) The system of claim 1 wherein the output device comprises a visual display on a monitor.

18. (Original) The system of claim 1 wherein the output device comprises a visual display on the pad.

19. (Previously presented) The system of claim 1 wherein the ablation apparatus comprises at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the ablation apparatus to the tissue, the suction source in communication with the suction opening, the suction source operatively adapted to provide suction to the suction opening.

20. (Currently Amended) A system for ablating a tissue comprising:

an ablation apparatus operatively adapted to ablate a first side of the tissue, the ablation apparatus comprising at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the ablation apparatus to the tissue;

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a temperature-sensing pad operatively adapted to sense temperature along a second side of the tissue opposite the first side in response to ablation energy being delivered to the first side, the temperature-sensing pad comprising an array of temperature elements in close proximity to each other to effectively detect continuous temperature along the second side of the tissue, and at least one suction opening positioned along a tissue contact surface, the suction opening operatively adapted to anchor the temperature-sensing pad to the tissue;

a suction source in communication with the suction openings, the suction source operatively adapted to provide suction to the suction openings; and

an output device in communication with the pad, the output device operatively adapted to provide a visual display of continuous transmuralinity of the ablated tissue based on the temperature sensed along the second side of the tissue.

21. (Currently Amended) A system for assessing transmuralinity of a linear ablation lesion in a tissue, the system comprising:

an ablation apparatus operatively adapted to deliver ablation energy to a first side of the tissue to create a linear ablation lesion;

an array of temperature sensors operatively adapted to sense temperature at a plurality of points of contact along a second side of the tissue in response to ablation energy being delivered to the first side of the tissue, the second side of the tissue being opposite the first side of the tissue, wherein the temperature sensors are in close proximity to each other to effectively detect continuous temperature along the second side of the tissue; and

an output device in communication with the array of temperature sensors, the output device operatively adapted to provide an indication of continuous transmuralinity of the linear ablation lesion at the second side of the tissue based on the sensed temperature.

22. (Previously Presented) The system of claim 21 wherein the array of temperature sensors forms a grid configuration.

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23. (Previously Presented) The system of claim 22 wherein the output device displays a representation of the grid configuration to indicate where the ablation is both transmural and continuous.
24. (Previously Presented) The system of claim 23 wherein continuity of the ablation is determined by a substantially continuous pattern of temperature sensors indicating transmurality at the second side of the tissue.
25. (Previously Presented) The system of claim 21 wherein the output device is adapted to provide an indication of continuity of the linear ablation lesion at the second side of the tissue.
26. (Previously Presented) The system of claim 21 wherein the indication of transmurality provided by the output device is a visual indication.
27. (Previously Presented) The system of claim 26 wherein the visual indication is a graphical indication of continuity of the linear ablation lesion at the second side of the tissue.
28. (Previously Presented) The system of claim 27 wherein the graphical indication includes the use of color.
29. (Previously Presented) The system of claim 21 wherein transmurality is determined as a function of time and sensed temperature.